

Microsoft Power BI

Step

by

Step

Nuric Ugarte
José Rafael Escalante



PRACTICE FILES

FREE SAMPLE CHAPTER |





Microsoft Power BI Step by Step

Nuric Ugarte
José Rafael Escalante

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Owen Auger

Cover Designer

Twist Creative, Seattle

Compositor

codeMantra

Contents

Acknowledgments	xiii
About the authors.....	xv



Introduction	xvii
Who this book is for	xvii
How this book is organized	xviii
Download the practice files	xix
Get support and give feedback.....	xx
Errata.....	xx



Introduction to Power BI	1
Practice files	1
Understand how Power BI fits into the BI ecosystem.....	2
Explore Power BI's role within Microsoft Fabric	3
What makes Power BI different from its competitors?.....	4
Identify the main components of Power BI.....	5
Power BI Desktop: Building reports and models	5
Power BI Service: Sharing and collaborating in the cloud.....	6
Power BI Mobile: Access to data from any device	8
Recognize the key roles involved in working with Power BI.....	9
Skills review	10
Practice tasks	11
Understand how Power BI fits into the BI ecosystem.....	11
Identify the main components of Power BI.....	11
Recognize the key roles involved in working with Power BI.....	11

2

Setting up Power BI	13
Practice files	13
Install and set up Power BI Desktop	13
Power BI Desktop installation options	14
Start Power BI Desktop	19
Explore Power BI Desktop interface	21
Main elements of the Power BI Desktop interface	22
Configure Power BI Desktop settings	27
Recommended setup options	28
Check your Power BI Desktop version	28
Skills review	30
Practice tasks	31
Install and set up Power BI Desktop	31
Explore Power BI Desktop interface	31
Configure Power BI Desktop settings	32

3

Importing data	33
Practice files	33
Explore Power Query Editor	34
Discover Power Query interface	35
Get Data in Power BI	36
Connect to common data sources	40
Get data from Excel and CSV files	40
Get data from folders	44
Get data from relational data sources	46
Get data from the web	48
Get data from online services	51
Select the appropriate storage mode	51
Comparison Table	52
Understand privacy levels	53
Skills review	55

Practice tasks	56
Explore Power Query Editor	56
Connect to common data sources	56
Select the appropriate storage mode	57
Understand privacy levels	58

4

Transforming data with Power Query	59
Practice files	59
Understand Power Query	60
Recognize the role of data quality and cleansing	60
Define data types	61
Apply columnar transformations	61
Fill missing content	62
Remove duplicates	63
Combine columns	65
Extract text	66
Replace values	67
Column from examples	69
Grouping data	70
Change table structures	71
Unpivot	71
Pivot Column	73
Combine and append tables	74
Combining tables	74
Appending tables	76
Skills review	78
Practice tasks	79
Understand Power Query	79
Recognize the role of data quality and cleansing	79
Define data types	79
Apply columnar transformations	80
Change table structures	80
Combine and append tables	80

5

Creating a simple semantic model	81
Practice files	81
Understand the fundamentals of the semantic model	82
Single table	82
Two or more tables	83
Types of tables	84
Define relationships between tables	84
Differentiate types of relationships	86
Control cross-filter direction	87
Manage active and inactive relationships	90
Customize the semantic model and manage its properties	91
Column tools	91
Other properties	94
Layouts	96
Skills review	97
Practice tasks	98
Understand the fundamentals of the semantic model	98
Define relationships between tables	98
Differentiate types of relationships	98
Control cross-filter direction	98
Manage active and inactive relationships	99
Customize the semantic model and manage its properties	99

6

Performing basic calculations with DAX	101
Practice files	101
Explore the DAX execution framework	102
Calculated columns	102
Measures	103
Calculated tables	104
Visual calculations	104
Write basic syntax and apply common functions	105

Aggregation functions.....	107
Aggregations with more than one column.....	109
Perform conditional calculations.....	110
Understand CALCULATE and its impact on filter context.....	112
Integrate visual calculations.....	117
Skills review.....	119
Practice tasks.....	120
Explore the DAX Execution framework.....	120
Write basic syntax and apply common functions.....	120
Perform conditional calculations.....	120
Understand CALCULATE and its impact on filter context.....	120
Integrate visual calculations.....	121

7

Building your first report.....	123
Practice files.....	123
Explore the Report view.....	123
Filters pane.....	126
Understand types of visual objects.....	128
Column charts.....	128
Line and area charts.....	129
Trend analysis and contribution charts.....	130
Relationship and proportion charts.....	130
Key indicators and metrics.....	131
Tabular and hierarchical visualizations.....	132
Slicers.....	132
Insert and customize visual objects.....	133
Card.....	133
Line chart.....	137
Stacked bar chart.....	142
Ribbon chart.....	143
Treemap.....	144
Stacked column chart.....	145
Organize layout and apply slicers and filters.....	145

Skills review	149
Practice tasks	150
Explore the Report view	150
Understand types of visual objects	150
Insert and customize visual objects	150
Organize layout and apply slicers and filters.	151

8

Designing advanced visualizations	153
Practice files	153
Visualize geographic data using maps	154
Compare variables and reveal patterns with scatter charts	157
Break down measures and explore categories with decomposition trees	160
Display multiple comparisons using small multiples.	163
Analyze trends, forecast values, and detect anomalies using line charts	165
Trend lines	165
Forecast	166
Anomalies	167
Summarize key metrics using narrative text	168
Skills review	170
Practice tasks	172
Visualize geographic data using maps	172
Compare variables and reveal patterns with scatter charts	172
Break down measures and explore categories with decomposition trees.	173
Display multiple comparisons using small multiples.	173
Analyze trends, forecast values, and detect anomalies using line charts	173
Summarize key metrics using narrative text	174

9

Enhancing reports	175
Practice files	175
Apply themes to shape visual identity	176
Navigate into details using drillthrough pages	180

Trigger actions via buttons, shapes, and images	183
Show insights with tooltips and field parameters	186
Control report behavior by applying bookmarks	190
Adapt layouts for mobile experiences.....	192
Skills review	194
Practice tasks	195
Apply themes to shape visual identity	195
Navigate into details using drillthrough pages	195
Trigger actions via buttons, shapes, and images	195
Show insights with tooltips and field parameters	196
Control report behavior by applying bookmarks	196
Adapt layouts for mobile experiences.....	196

10

Publishing and sharing reports	197
Practice files	197
Explore the Power BI Service	198
Key Power BI Service concepts	198
Set up an account in the Power BI Service.....	200
Publish reports from Power BI Desktop	201
Navigate the Power BI Service.....	202
Schedule data refreshes	203
Configure a scheduled refresh	203
Collaborate and share in the Power BI Service	205
Share reports and dashboards	206
Collaborate in workspaces	208
Publish and distribute a Power BI app.....	209
Share with external users	211
Manage permissions	212
Skills review	212
Practice tasks	213
Explore the Power BI Service	213
Schedule data refreshes	213
Collaborate and share in the Power BI Service	213

11

Creating dashboards	215
Practice files	215
Build a dashboard from a report	215
Understand dashboard tiles	216
Customize tiles	219
Add comments to a dashboard	221
Add a comment to a visual	223
Set data alerts on dashboard tiles	224
View insights on dashboard tiles	226
Skills review	228
Practice tasks	229
Build a dashboard from a report	229
Add comments to a dashboard	229
Set data alerts on dashboard tiles	230
View insights on dashboard tiles	230

12

Applying advanced topics and best practices	233
Practice files	233
Implement row-level security (RLS)	234
Define roles in Power BI Desktop	234
Test roles in Power BI Desktop	238
Assign users to roles	238
Test roles in the Power BI Service	239
Apply Power Query best practices	241
Reduce data volume and granularity	241
Avoid complex transformations in Power BI	244
Rename steps and queries clearly	244
Choose appropriate data types	245
Consolidate applied steps	245
Leverage query folding	246

Optimize the semantic model	247
Adopt a star schema design	248
Use descriptive names	248
Add meaningful descriptions	249
Hide unnecessary fields	249
Group and summarize your data	249
Optimize relationships	250
Write efficient DAX expressions	251
Use variables to improve performance and clarity	251
Avoid forcing zero values in measures with no data	252
Use measures instead of calculated columns	252
Avoid costly and complex DAX functions	252
Apply data visualization best practices	253
Simplify the layout	253
Limit data displayed	254
Optimize interactions	254
Optimize slicer usage	255
Optimize tables and matrices	256
Use certified visuals	257
Avoid animated visuals	257
Use Performance Analyzer to troubleshoot slow visuals	257
Design clean, effective dashboards	259
Skills review	262
Practice tasks	263
Implement row-level security (RLS)	263
Apply Power Query best practices	263
Optimize the semantic model	264
Write efficient DAX expressions	264
Apply data visualization best practices	264

Exploring Copilot in Power BI	265
Practice files	265
Understand Copilot in Power BI	266
Explore the different Copilot experiences	266
How different roles use Copilot	268
Key capabilities overview	269
Configure prerequisites and enable Copilot	269
Prepare semantic models for AI	272
Best practices for preparing your semantic model	273
Tools to prepare your data for AI	273
Mark your model as prepped for AI	275
Use Copilot in Power BI Desktop	276
Create complete reports with Copilot	276
Create a narrative visual with Copilot	278
Write and explain DAX queries with Copilot	280
Create descriptions for DAX formulas	282
Explore Copilot in the Power BI Service	282
Find content with the standalone Copilot experience	283
Create a report page with Copilot in the Service	284
Summarize a report with Copilot	284
Add a narrative with Copilot (Narrative visual)	285
Ask Copilot for data from your model	285
Create DAX queries with Copilot in the Power BI Service	286
Skills review	287
Practice tasks	288
Understand Copilot in Power BI	288
Prepare semantic models for AI	288
Use Copilot in Power BI Desktop	289
Explore Copilot in the Power BI Service	289
Index	291

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This book is dedicated to everyone who believes in the power of data to transform decisions, organizations, and lives.

José Rafael Escalante

First of all, I want to thank Nuric for inviting me to be part of this project, and for her patience and trust during the moments when I doubted my ability to translate knowledge and professional experience into these pages.

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About the authors



Nuric Ugarte is a business intelligence consultant and Microsoft Certified Trainer (MCT) specializing in Microsoft Fabric and Power BI, with extensive experience delivering enterprise analytics solutions for major companies in the USA, Canada, and LATAM, working across a wide range of industries.

She regularly delivers workshops and training sessions on Microsoft Fabric and Power BI, empowering professionals and organizations to successfully adopt these technologies.

She is also active in the data community, contributing articles on a wide range of topics in Microsoft Fabric and Power BI, from data modeling and performance optimization to security, licensing, best practices, and certification preparation through her Gold Data blog.

Nuric served as a technical editor for *Exam Ref DP-600 Implementing Analytics Solutions Using Microsoft Fabric*, published by Pearson.



José Rafael Escalante is a consultant and trainer specializing in data analytics and business visualization, with a proven track record in the strategic use of Microsoft Power BI. He was recognized as a Most Valuable Professional (MVP) in the Data Platform category, he has assisted organizations from different sectors in adopting business intelligence solutions, combining technical precision with pedagogical sensitivity.

His approach as an educator is reflected in a modular, clear, and empathetic narrative, aimed at facilitating understanding without sacrificing technical depth. Throughout his nearly decade-long career, he has developed semantic models, business reports, specialized articles, and educational video content, including online courses and a YouTube channel. He has also hosted a podcast and participated in technical community events, bringing complex concepts to a wide audience in an accessible and meaningful way.

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Introduction



Microsoft Power BI is a leading business intelligence platform that enables individuals and organizations to transform raw data into actionable insights. With Power BI, you can connect to a wide variety of data sources, clean and transform the data, model it effectively, and create interactive reports and dashboards that communicate insights clearly. Power BI also integrates seamlessly with the Microsoft ecosystem, including Excel, Teams, PowerPoint, and now Copilot, making it a key tool for modern, data-driven decision-making.

This book is part of the *Step by Step* series, designed to guide you through the fundamentals of Power BI with clear explanations and practical, hands-on exercises. Whether you are new to data analysis or already familiar with Microsoft tools, this book provides the knowledge and skills you need to confidently use Power BI for your own projects.

Who this book is for

Microsoft Power BI Step by Step is written for beginning to intermediate users who want to learn how to analyze, visualize, and share data effectively. If you have experience with Excel or other Microsoft applications but are new to Power BI, this book will help you get started and progress to more advanced scenarios at your own pace.

This book is ideal for

- Business analysts and data analysts who need to transform and visualize data
- Excel power users who want to expand their skills into modern BI tools
- IT professionals and consultants who need to support business users with reporting
- Students, researchers, and small business owners who want to make data-driven decisions

At the same time, this book goes beyond the basics. In addition to covering the core skills every Power BI user needs, it includes a dedicated chapter on advanced topics and best practices, providing guidance on performance tuning, row-level security (RLS), and scalable design. In addition, a full chapter on Copilot in Power BI shows how AI can accelerate tasks such as preparing data, generating DAX formulas, and creating effective visualizations. These advanced sections ensure that you gain not only solid foundational skills but also practical knowledge to take your Power BI projects to the next level.

How this book is organized

This book is divided into 13 chapters:

- **Chapter 1, Introduction to Power BI**, provides an overview of the Power BI ecosystem, its main components, and its role in the business intelligence landscape.
- **Chapter 2, Setting up Power BI**, covers the installation and initial configuration of Power BI Desktop, including an introduction to the interface and essential settings.
- **Chapter 3, Importing data**, explores the Power Query Editor, shows how to connect to common data sources, explains storage modes, and describes privacy levels.
- **Chapter 4, Transforming data with Power Query**, focuses on cleaning and shaping data by defining data types, applying transformations, adjusting table structures, and combining queries to prepare reliable datasets for analysis.
- **Chapter 5, Creating a simple semantic model**, explains how to define relationships, manage filters and hierarchies, and customize the semantic model.
- **Chapter 6, Performing basic calculations with DAX**, introduces the DAX formula language and shows how to create simple measures and calculated columns.
- **Chapter 7, Building your first report**, explains how to create an interactive report by adding and customizing visuals, applying slicers and filters, and organizing the layout for clarity.

- **Chapter 8, Designing advanced visualizations**, explores complex visuals such as maps, scatter plots, decomposition trees, and small multiples.
- **Chapter 9, Enhancing reports**, covers techniques to improve design and interactivity, including themes, bookmarks, tooltips, and mobile layouts.
- **Chapter 10, Publishing and sharing reports**, explains how to publish reports to the Power BI Service, configure scheduled refreshes, and collaborate in workspaces.
- **Chapter 11, Creating dashboards**, shows how to combine content from multiple reports into dashboards, add comments, and configure data alerts.
- **Chapter 12, Applying advanced topics and best practices**, discusses row-level security (RLS), performance tuning, DAX optimization, and visualization best practices.
- **Chapter 13, Exploring Copilot in Power BI**, demonstrates how AI can assist in preparing data, generating DAX formulas, and recommending visuals both in Power BI Desktop and the Service.

The structure of these chapters allows you to learn the basics step by step if you are new to Power BI. If you are already familiar with data analysis, you can focus on the chapters that are most relevant to your needs. Each topic is self-contained, so you can follow the book from start to finish or jump directly to the skills you want to acquire.

At the end of each chapter, you will also find a series of practice tasks that allow you to apply the skills introduced in the chapter.

Download the practice files

Before you can complete the exercises in this book, you need to download the book's practice files to your computer. These practice files can be downloaded from the Downloads tab on the following page:

[MicrosoftPressStore.com/powerbiSBS/downloads](https://microsoftpressstore.com/powerbiSBS/downloads)



IMPORTANT To complete the practice tasks in this book, you need to have Power BI Desktop installed on your computer. You can download it free from the Microsoft Store or from the official Power BI website.

The following table lists the practice files for this book.

Chapter	File
Chapter 3: Importing data	Financial Sample.xlsx Sales folder with five .CSV files.
Chapter 4: Transforming data with Power Query	Applying columnar transformations.xlsx Changing table structures.xlsx Combining and appending tables.xlsx
Chapter 5: Creating a simple semantic model	customer.csv date.csv product.csv sales.csv store.csv
Chapter 6: Performing basic calculations with DAX	DAX Practice file.pbix
Chapter 7: Building your first report	Report practice file.pbix
Chapter 9: Enhancing reports	Enhancing reports practice file.pbix

Get support and give feedback

The following sections provide information about getting help with this book and contacting us to provide feedback or report errors.

Errata

We've made every effort to ensure the accuracy of this book and its companion content. Any errors that have been reported since this book was published are listed at:

MicrosoftPressStore.com/powerbiSBS/errata

If you discover an error that is not already listed, please submit it to us at the same page.

For additional book support and information, please visit *MicrosoftPressStore.com/Support*.

Please note that product support for Microsoft software and hardware is not offered through the previous addresses. For help with Microsoft software or hardware, visit *support.microsoft.com*.

Setting up Power BI

2

Practice files

No practice files are necessary to complete the practice tasks in this chapter.

In this chapter, you'll learn how to get started with Power BI Desktop, the main application used for creating reports and semantic models in Power BI. Power BI Desktop is a free Windows application that provides everything you need to design, build, and publish powerful data visualizations. It's the starting point for most Power BI projects and is used by analysts, developers, and business users alike.

This chapter will walk through the different ways to install Power BI Desktop, review the system requirements, and explore what happens the first time you launch the app. You'll also become familiar with the user interface and learn how to configure a few key settings to optimize your experience.

Install and set up Power BI Desktop

Before building your first report, you'll need to install Power BI Desktop. In this section, you'll learn the two installation methods, how to verify that your computer meets the system requirements, and what to expect the first time you launch the application.

In this chapter

- Install and set up Power BI Desktop
- Explore Power BI Desktop interface
- Configure Power BI Desktop settings

Power BI Desktop installation options

You can install Power BI Desktop in two ways:

1. Install from the Microsoft Store.
2. Download an executable file (.exe) from the Power BI website.

Both options will give you the latest version, but they work slightly differently and offer different advantages.



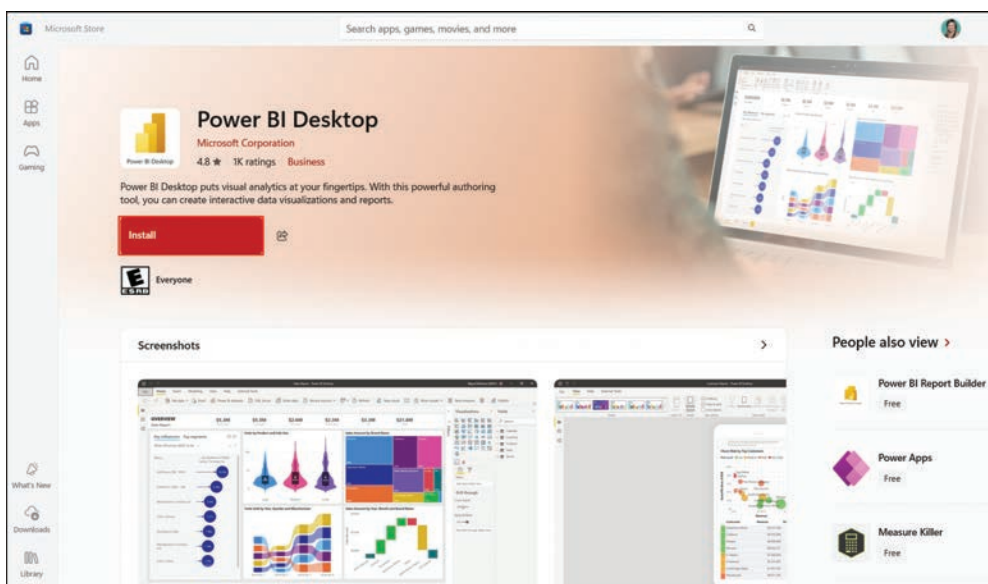
IMPORTANT Power BI Desktop is updated every month, incorporating community feedback, new features, performance improvements, and visual enhancements.

Install from the Microsoft Store

The most recommended and easiest way to install Power BI Desktop is from Microsoft Store. You don't need administrator permissions, and updates are performed automatically, ensuring you always have the latest version.

To install

1. Open your browser and go to the Power BI Desktop page in the Microsoft Store.
2. Select **Install** to download and install the app.



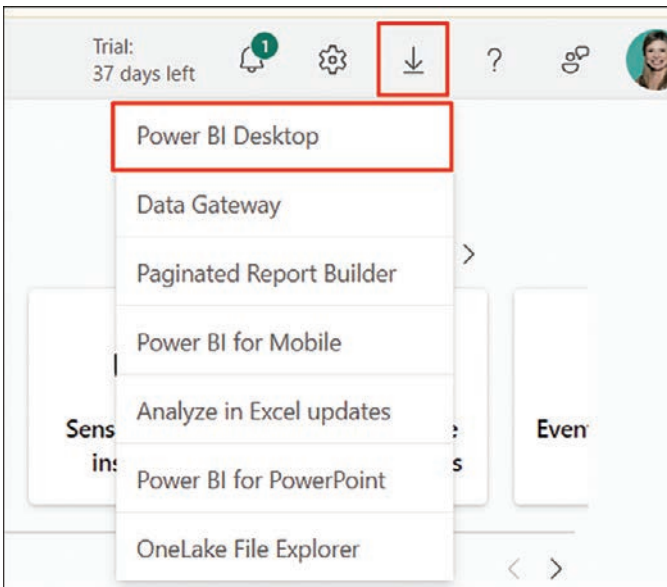
Install Power BI Desktop listing from Microsoft Store.

- After it is installed, you can launch Power BI Desktop from the Start menu or directly from the Microsoft Store.



TIP You can also access the Microsoft Store link from the Power BI service. Just select the **Download** icon in the upper-right corner; then select **Power BI Desktop**.

2



Accessing Microsoft Store from Power BI Service.

Installing from the Microsoft Store is the easiest and most convenient option. It provides automatic updates, does not require administrator rights, simplifies implementation across the organization, and reduces the download size by updating only the modified components. It also automatically detects your system language and applies it to both the interface and the data model.



TIP Installing Power BI Desktop from the Microsoft Store doesn't copy user settings from the .exe version. You might have to reconnect to your recent data sources and reenter your credentials.



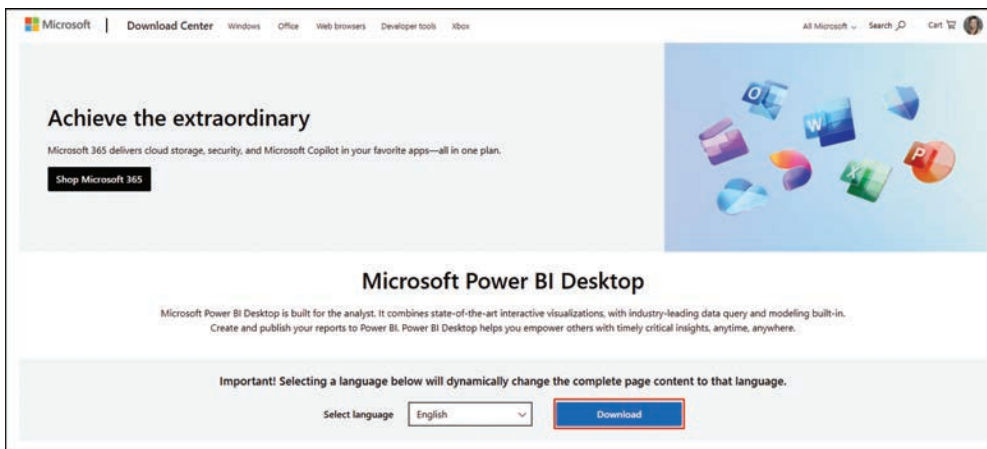
TIP If you use SAP connectors, you might need to move driver files manually to C:\Windows\System32.

Download as an executable file

If you prefer not to use the Microsoft Store, you can download the .exe installer from the Power BI Download Center.

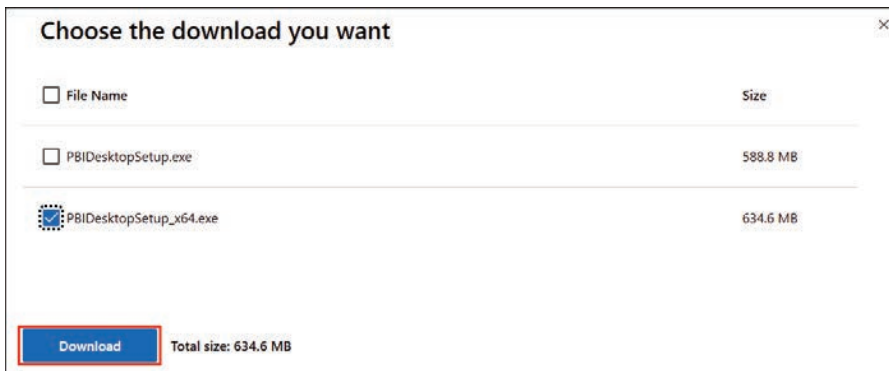
To install

1. Visit the Power BI Desktop Download Center page.
2. Use the dropdown list to choose the language for the installation file and select **Download**.



Download Power BI Desktop from the Microsoft Download Center.

3. Select the appropriate version and select **Download**.

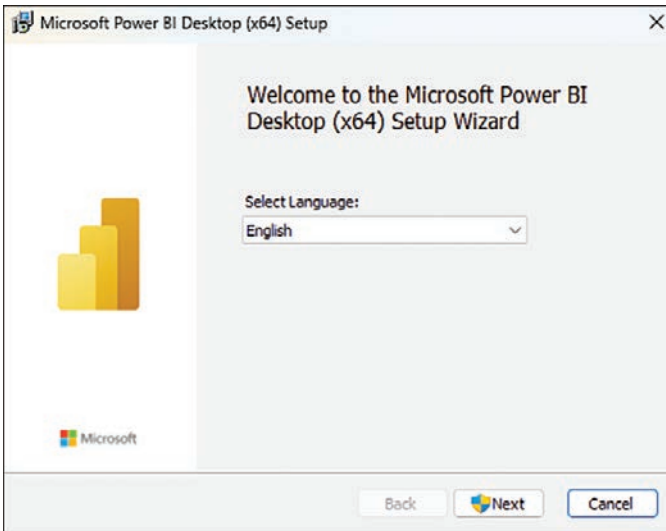


Power BI Desktop download options.



IMPORTANT Microsoft announced the end of support for the 32-bit version of Power BI Desktop on July 31, 2025. Only the 64-bit version is now available; it offers better performance and is compatible with most modern systems.

- Once the download is complete, double-click the file to run the installer and click **Next**.



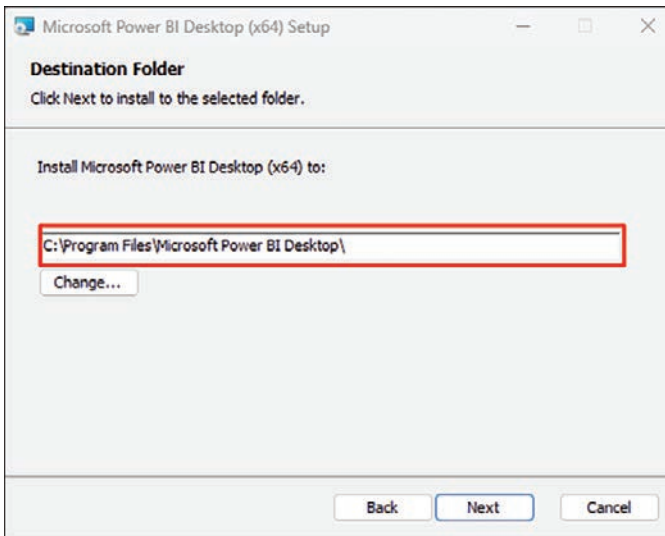
Power BI Desktop Setup wizard.

- Windows will ask you to allow the app to make changes to your device. Click **Yes** to continue with the installation.



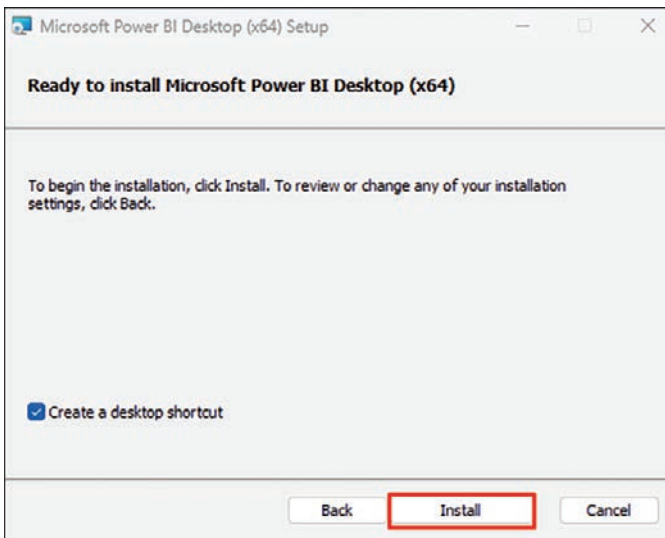
IMPORTANT You must have administrator privileges to complete this step.

- You'll be asked to accept the Microsoft Software License Terms. Review the license agreement. To proceed, you must check the box **I accept the terms in the License Agreement** and then select **Next**.
- Choose the Installation Folder and select **Next**.



Destination Folder.

8. You'll see a summary screen confirming you're ready to install Power BI Desktop. Here, you can also choose whether to create a desktop shortcut (enabled by default). Select **Install** to begin the process.



Installing Power BI Desktop.



IMPORTANT Do not install both the Microsoft Store version and the executable version at the same time. Uninstall one before switching to the other.

Downloading Power BI Desktop as an executable file offers greater flexibility and control, allows portable installations, and supports command-line deployment. This executable file can be reused on multiple computers. In addition, it can provide access to previous versions for compatibility or testing purposes, which is especially useful for advanced users or enterprise environments.

System requirements

Before installing, check that your PC meets the minimum requirements.



IMPORTANT Power BI Desktop is no longer supported on Windows 8.1 or earlier.

Requirement	Details
Operating system	Windows 10, Windows Server 2016 or later
.NET	.NET 4.7.2 or later
Memory (RAM)	Minimum 2 GB, 4 GB or more recommended
Display resolution	At least 1440x900 (16:9); lower resolutions are not supported
CPU	1 GHz or faster, 64-bit processor or better recommended
WebView2 runtime	Required. If not installed, download from Microsoft Edge Developer page




IMPORTANT Power BI Desktop is available only for Windows. If you're using a Mac, you can access the Power BI Service through a web browser to view and interact with published reports. If you need to create or model data, you can run Power BI Desktop using a virtual machine or Windows emulator.

Start Power BI Desktop

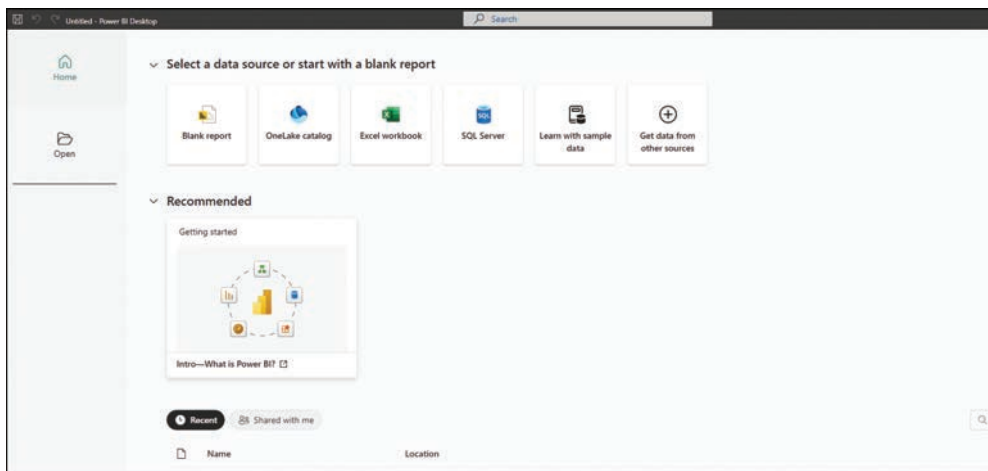


IMPORTANT After you launch the installation package, Power BI Desktop installs as a standard Windows application that you can launch from the Start menu like any other app.

When you open Power BI Desktop for the first time, a welcome screen appears, designed to help you quickly begin your work. At the top, under the heading “Select a data source or start with a blank report,” you’ll see several common options such as starting with a Blank report or connecting to a OneLake catalog, an Excel workbook, a SQL Server, or even sample data. If you don’t see the source you need, you can select **Get data from other sources** to access the full list of available connectors.

 **SEE ALSO** To learn how to connect to and import data from these sources, see Chapter 3, “Importing data.”

Below that list, a Recommended section offers helpful resources to get you started, like tutorials or Power BI content that links to Microsoft learning material. At the bottom of the screen, the Recent and Shared with me tabs help you reopen reports you’ve worked on or that others have shared with you.



Start Power BI Desktop.

If this is a fresh install (not an upgrade), you may be asked to

- Sign in with a work or school account.
- Fill out a short form to proceed without signing in.

After that, you’re ready to build and publish your first report.

Sign in to Power BI Desktop

You can use Power BI Desktop without signing in, even if you don't have a Power BI user license. However, the following features require that you sign in with a valid work or school account:

- Connect to online data sources (e.g., SharePoint Online, Microsoft Dataverse).
- Publish reports to the Power BI Service.
- Use tenant-specific features like organizational visuals.
- Apply sensitivity labels or access other premium capabilities.



TIP If you're just learning or building reports locally, you can skip the sign-in process. But when you're ready to share, you'll need to be signed in.

To sign in

1. In the top-right corner of Power BI Desktop, select **Sign in**.
2. Enter your work or school email address.



IMPORTANT Power BI does not support personal email accounts such as @gmail.com, @outlook.com, or @yahoo.com for sign-in. You must use a valid work or school account.

3. Complete the login process (typically through your organization's Microsoft 365 portal).
4. After you're signed in, you will see your profile picture or initials in the top-right corner of the window.



TIP You can also sign out or switch accounts anytime by selecting your profile icon in the same location.

Explore Power BI Desktop interface

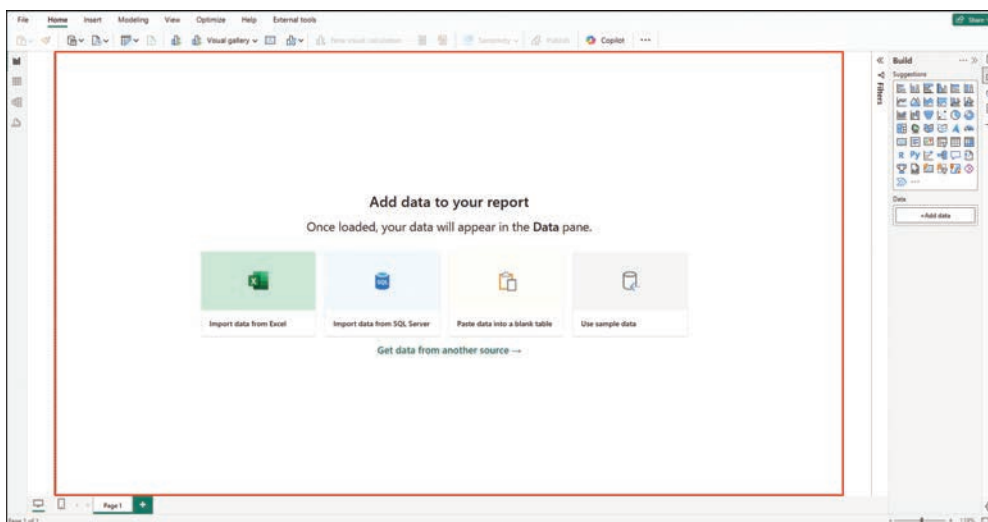
Power BI Desktop offers a clean and intuitive interface designed to guide you through the process of building reports.

Main elements of the Power BI Desktop interface

Power BI Desktop is organized into distinct interface elements that support the report creation process. Each part of the interface serves a specific function, whether for designing visuals, modeling data, or navigating your report. The following sections describe the key areas of the Power BI Desktop interface.

Canvas

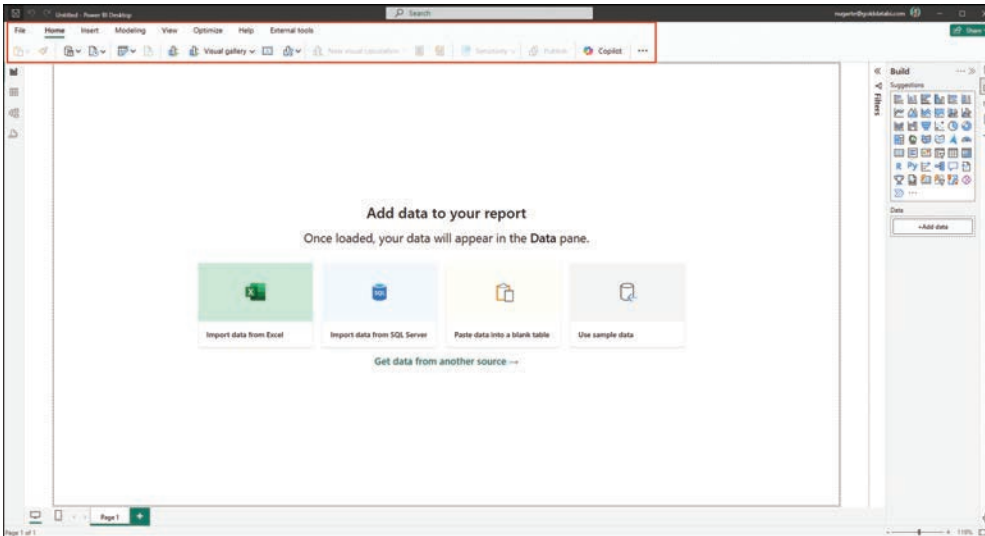
The canvas is the central workspace in Power BI Desktop where you build and design your reports. It's a blank page where you drag fields, insert visuals, and arrange content to tell a story with your data. You can create multiple pages within a report, each with its own layout and visuals.



Report Canvas.

Ribbon

The ribbon is the toolbar located at the top of Power BI Desktop. Each tab is organized by function, making it easy to navigate and find the commands you need while building your reports. If you've used applications like Microsoft Excel or PowerPoint, the Power BI layout will feel familiar.



Power BI Desktop ribbon.

Let's explore each tab on the ribbon and its main features:

- **Home:** This tab is your starting point in Power BI Desktop. It includes the most used commands for managing your reports, data, and visuals. From here, you can connect to various data sources, refresh and transform data using the Power Query Editor, and publish reports to the Power BI Service. The tab also includes basic editing actions such as undo, redo, and copy/paste, as well as access to tools such as Copilot and the visual gallery.
- **Insert:** This tab allows you to add new elements to your report canvas, such as visuals, images, text boxes, and shapes. This tab also enables you to add buttons, such as navigation arrows, bookmarks, Q&A triggers, and slicer controls to enhance interactivity. Additionally, you can insert new report pages to better organize your report.
- **Modeling:** This tab is the place where you define the logic of your data model. You can create new tables, columns, and measures using Data Analysis Expressions (DAX), define relationships between tables, mark a table as a date table, and create parameters. This tab also includes security features, such as row-level security (RLS), to manage user-level access.



TIP The Modeling tab becomes essential after your data is loaded and you're ready to structure it for analysis.

- **View:** This tab allows you customize the overall appearance and layout of your report. You can apply different themes for color consistency, use the Selection and Bookmarks panes to manage visibility and interactivity, and control the display of items like gridlines. Additionally, you can open the Performance Analyzer to evaluate how efficiently your report loads and runs.
- **Optimize:** This tab focuses on performance tuning and report efficiency. It provides tools to pause and refresh visuals, manage query reduction settings, apply or clear slicers, and run the Performance Analyzer.



SEE ALSO For more details on performance tuning, see Chapter 12, “Applying advanced topics and best practices.”

- **External Tools:** On this tab, you’ll find tools like DAX Studio or Tabular Editor, which offer extended capabilities beyond Power BI Desktop’s native functions. Experienced developers use these functions to perform detailed modeling, advanced DAX authoring, or version control.
- **Help:** This tab provides easy access to Power BI documentation, tutorials, and community support. From here, you can find learning resources, report issues, and explore updates or training materials.

Power BI Panels

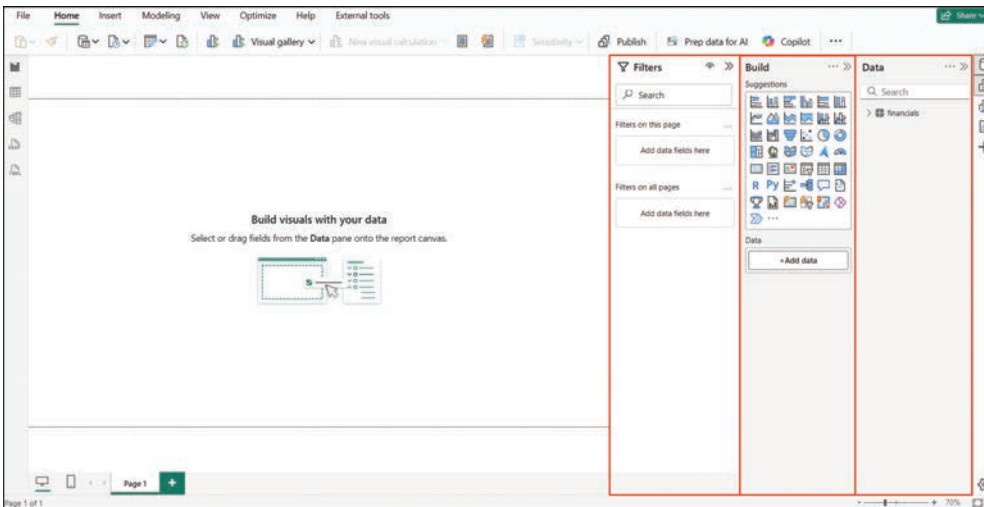
Power BI Desktop includes several panels that help you manage your data, customize visuals, and control what is displayed in your reports. These panels are located on the right side of the interface and are essential for building and refining your report content.

- **Data Pane:** This pane shows all the data tables and fields you’ve loaded into your report. You can expand tables to see individual columns, measures, and hierarchies. Just drag and drop any field from here onto the canvas to use it in a visual. You can also right-click to rename, hide, or create new fields.
- **Build Pane:** This pane is essential for customizing how your data is displayed. Here you can choose the type of chart or visual you want to use, such as bar charts, pie charts, maps, cards, or tables. After selecting a visual, use the same pane to assign fields to different parts of the chart and format it with colors, labels, and more.

- Filters Pane:** This pane enables you to control what data appears in your report. You can filter data at the visual, page, or report level. Just drag a field into the filter area and choose your filter options. This pane makes it easy to tailor the view for different users or use cases without changing the main visuals.



TIP Although you can add slicers to the report for user interaction (we'll cover this topic later in Chapter 7, "Building Your First Report"), the Filters pane allows you to apply filters in the background. It's especially useful for applying filters that you don't need to see or interact with, such as hiding specific categories or limiting the report to a date range.



Power BI panels.



TIP By default, Power BI Desktop displays the Filters, Build, and Data panes on the right side of the screen. Depending on the size of your screen or the selected visual, some panes may be collapsed or hidden. Select their icons to show or hide them as needed.

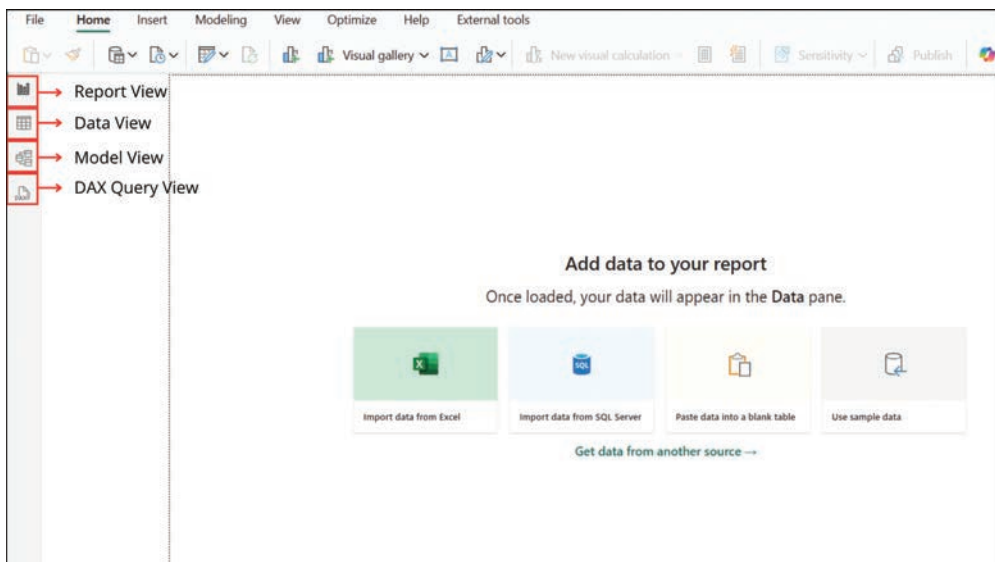
Pages Tab

The Pages tab, located at the bottom of the canvas, allows you to add and manage multiple report pages, just like slides in PowerPoint. Each page can show a different perspective of your data. You can rename pages, duplicate them, or rearrange their order to create a logical flow for your report.

Power BI Desktop Views

Power BI Desktop offers four main views, each designed for a specific part of the report creation process. You can switch between them using the icons on the left sidebar.

- **Report View:** This is the default view where you design your reports using visuals. You'll use this view most of the time to drag fields, add charts, and format your report layout.
- **Data View:** This view shows your data in table form, similar to Excel. It's useful for reviewing imported data, calculating columns, or verifying your transformations.
- **Model View:** This view allows you to create and manage relationships between tables. It's essential when you're working with multiple data sources or building a complex data model.
- **DAX Query View:** This advanced view lets you write and run DAX queries to explore or troubleshoot your data model. It's helpful for users with more technical needs or deeper analysis.



Power BI views.

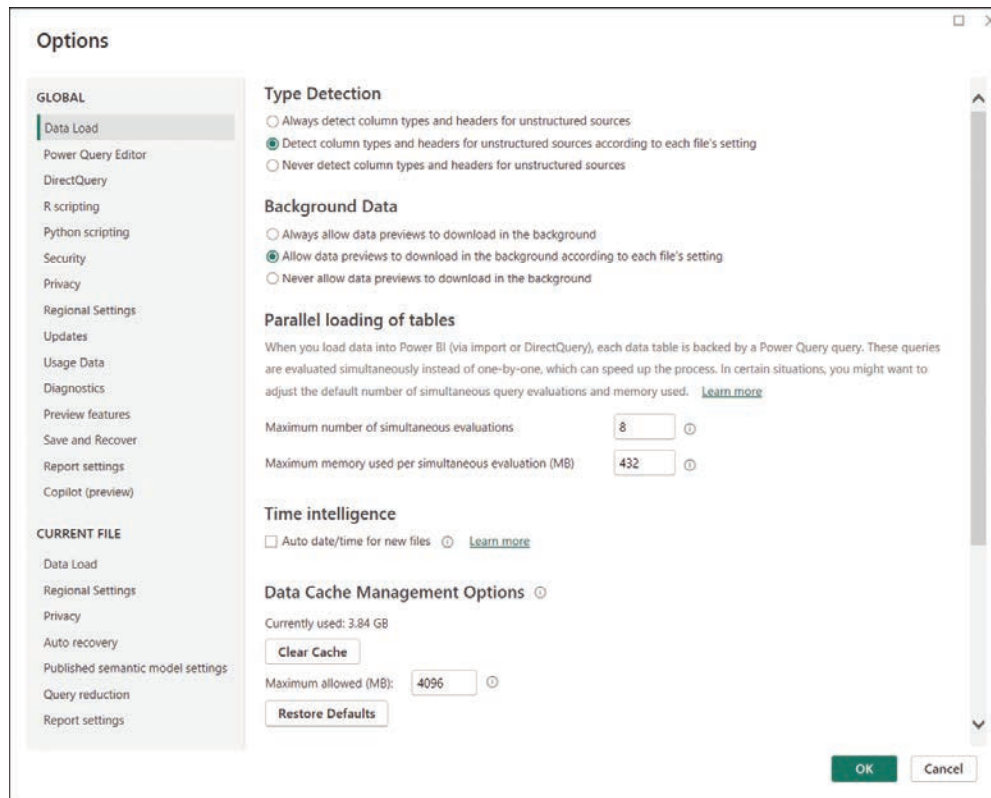
Configure Power BI Desktop settings

Before you begin working on your first report, it's a good idea to review a few optional settings that can improve your experience with Power BI Desktop. You don't need to make changes right away, but knowing where to find these settings will be useful as you advance.

To access the settings, select **File > Options and settings > Options**.

The Options window organizes settings into two main categories in the left menu:

- **Global:** Applies to all files and Power BI Desktop in general
- **Current File:** Applies only to the report you are currently working on



Power BI configuration.

Recommended setup options

To ensure a smoother and more personalized experience while working in Power BI Desktop, let's explore some recommended setup options that help optimize functionality, improve usability, and protect your work.

Enable preview features

Power BI frequently releases experimental features that you can try as they become officially available. To enable them, select **File > Options and settings > Options > Preview features** and check any features you'd like to activate.



TIP You must restart Power BI Desktop to apply the changes.

Set regional settings

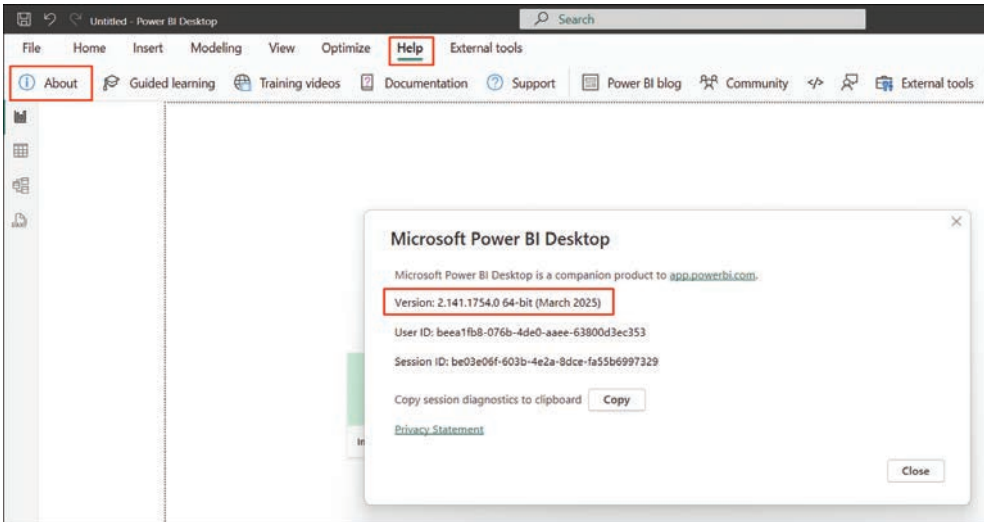
Under **Current File > Regional Settings**, you can specify your locale. This setting controls how dates, numbers, and currencies are displayed in your reports. Choose the region that matches your preferred formatting.

Enable autosave

To avoid losing your work, you can turn on Autosave. To do so, select **Current File > Save and enable autosave**. You can also configure how frequently Power BI saves your work automatically.

Check your Power BI Desktop version

To find out which version of Power BI Desktop you are using, select **Help > About > Version Information**. This information is helpful when you're troubleshooting or checking compatibility with certain features.



Power BI version.

Knowing your current version is especially useful when

- **Troubleshooting issues:** If you encounter unexpected behavior or errors, support resources often need to know your version number to assist you accurately.
- **Matching documentation:** Power BI updates monthly, and features may appear, change, or be deprecated. Verifying your version helps ensure you're following guidance that aligns with your software.
- **Collaborating with others:** Teams using different versions may notice inconsistencies in features or visual behavior, so aligning versions ensures a smoother workflow.
- **Accessing the latest features:** If you're missing a feature mentioned in this book or elsewhere, checking your version is the first step to confirming whether an update is needed.



TIP Always use the latest version of Power BI Desktop to benefit from performance improvements, new features, and bug fixes. The Microsoft Store version updates automatically, but if you installed it via the executable file, you'll need to check for updates manually.

Skills review

In this chapter, you learned how to

- Install Power BI Desktop using either the Microsoft Store or the executable (.exe) installer from the Power BI website and understand the benefits and limitations of each installation method.
- Verify your system requirements to ensure your device is compatible with Power BI Desktop and supports optimal performance.
- Launch Power BI Desktop for the first time and sign in with a valid work or school account to access cloud-based features.
- Navigate the Power BI Desktop interface, including the report canvas, ribbon, views (Report, Data, Model, and DAX Query), and the Filters, Build, and Data panes to build, customize, and explore your reports effectively.
- Configure Power BI Desktop settings and check your Power BI version.

Practice tasks

No practice files are necessary to complete the practice tasks in this chapter.



Install and set up Power BI Desktop

Before you can start using Power BI, you'll need to install the application on your computer. Follow these steps to choose the right version and complete the setup process:

1. Choose and complete an installation method. Visit the Power BI website and decide whether to install the Microsoft Store version or download the executable file (.exe). Follow the steps outlined in this chapter to complete the installation on your device.
2. Check your version. After installing Power BI Desktop, select **Help > About** and note the version number currently installed.

Explore Power BI Desktop interface

After Power BI Desktop is installed, it's helpful to become familiar with its interface. The following steps will guide you through the key areas of the workspace so you can navigate it with confidence:

1. Launch Power BI Desktop. Open the **Start menu** and then select **Power BI Desktop**. Take a moment to examine the welcome screen and available data source options.
2. Familiarize yourself with the interface. Open Power BI Desktop and take a few minutes to explore the layout. Hover over different areas of the screen and identify the main elements of the interface, including the ribbon, the report canvas, and the Fields, Visualizations, and Filters panes on the right side.
3. On the left sidebar, locate the buttons that switch between Report, Data, Model, and DAX Query views.

Configure Power BI Desktop settings

To get the most out of Power BI Desktop, you may want to adjust certain settings. The following steps will help you personalize your experience and enable useful features:

1. Access the Options menu. Select **File > Options and settings > Options**.
2. Enable preview features (optional). Under Preview features, turn on any feature you'd like to explore. Remember to restart Power BI Desktop to apply the changes.
3. Review your regional settings. Under **Current File > Regional Settings**, select the appropriate locale for your reports.
4. Check autosave options. Under **Current File > Save**, ensure **autosave** is enabled and adjust the autosave frequency if needed.

Index

Symbols

@mentions, 223

A

active relationships, 90–91
aggregation functions, DAX, 107–110
aggregations, multi-column, 109–110
AI (artificial intelligence), semantic models, 272–276
alerts, dashboards, 224–226
All category (Get Data dialog), 36
ALLSELECTED function, 114
animated visuals, 257
anomalies, 167–168
apps, publishing and distributing, 209–211
area charts, Report view, 129
assigning, roles, 238–239
Autosave, 28
Azure category (Get Data dialog), 36

B

basic syntax, DAX, 105–107
BI (business intelligence), 1
bidirectional relationships, 251
bookmarks, reports, 190–192
Build pane (Desktop), 24
business users, Copilot, 268
buttons, reports, 183–185

C

CALCULATE function, 112–117
calculated columns, DAX, 102–103
calculated tables, DAX, 104
canvas
 Desktop, 22
 Service, 203
capacities, Power BI, 199
cardinality
 high, 243–244
 relationships, 84

cards, Report view, 133–137
categories, decomposition trees, 160–163
certified visuals, 257
charts
 line, 165–168
 Report view, 137–145
 scatter, patterns, 157–160
collaboration, workspaces, 208–209
Column charts, Report view, 128–129
Column tools, 91–96
columnar transformations, Power Query, 61–62
columns
 combining, Power Query, 65–66
 pivoting, 73–74
 unpivoting, 71–72
comments, dashboards, 221–223
common data sources, connecting, 40
comparisons, displaying multiple, 163–165
conditional calculations, DAX, 110–111
configuration, Desktop, 27–28
contribution charts, Report view, 130
Copilot, 265–266
 configuration, 269–272
 data queries, 285–287
 DAX queries, 280–281
 Desktop, 276
 narrative visuals, 278–280, 285
 pane, 266–268
 report creation, 276–278
 report pages, creating, 284
 reports, summaries, 284–285
 roles, 268–269
 Service, 282–286
COUNT aggregation function, 108
COUNTROWS aggregation function, 108
CSV files, data extraction, 40–44

D

dashboards, 215
 building from reports, 215–216
 comments, 221–223
 designing, 259–262
 permissions, 212

dashboards

- sharing, 205–212
- tiles, 216–219
 - customizing, 219–221
 - data alerts, 224–226
 - insights, 226–228
- data alerts, dashboards, 224–226
- data analysts, 9
- Data category setting (Column tools tab), 91–96
- data cleansing, Power Query, 60
- data extraction, 36–51
- Data groups setting (Column tools tab), 91–96
- data model owners, Copilot, 268
- Data pane (Desktop), 24
- data quality, Power Query, 60
- data refreshes, scheduling, 203–205
- Data setting (Column tools tab), 91–96
- data sources
 - connecting, 40
 - relational, data extraction, 46–48
- data types, Power Query, 61
- Data view (Desktop), 26
- data visualizations, 253–254
- data volume, reducing, 241–244
- Database category (Get Data dialog), 36
- DAX
 - aggregation functions, 107–110
 - CALCULATE function, 112–117
 - calculated columns, 102–103
 - calculated tables, 104
 - common functions, 105–107
 - conditional calculations, 110–111
 - data visualizations, 253–254
 - execution framework, 102
 - expressions, 101
 - writing efficient, 251–262
 - formulas, descriptions, 282
 - functions, 252–253
 - measures, 103
 - multi-column aggregations, 109–110
 - queries, Copilot, 280–281
 - variables, 251–252
 - visual calculations, 104–105
 - integration, 117–119
 - writing basic syntax, 105–107
- DAX Query view (Desktop), 26
- decomposition trees, 160–163
- DENSE function, 118
- descriptive names, 248–249

- Desktop, 1, 5–6, 13
 - canvas, 22
 - configuring, 27–28
 - Copilot, 276
 - installation, 14–19
 - interface, 21–26
 - Pages tab, 25
 - panels, 24–25
 - Performance Analyzer, 257–259
 - ribbon, 22–24
 - roles
 - assigning, 238–239
 - defining, 234–238
 - testing, 238
 - starting, 19–21
 - system requirements, 19
 - versions, 28–30
 - views, 26
- developers, 9
- dimension tables, 84
- dimensional modeling, 83
- DirectQuery storage mode, 52–53
- DISTINCTCOUNT aggregation function, 108
- distribution, apps, 209–211
- DIVIDE function, 117
- drillthrough pages, reports, 180–182
- Dual (Composite) storage mode, 52–53
- duplicate values, removing, Power Query, 63–64

E

- email accounts, support, 21
- end users, 9
- Entra B2B (Business-to-Business) accounts, 211
- Excel, data extraction, 40–44
- executable files, Desktop installation, 16–19
- execution framework, DAX, 102
- expressions
 - DAX, 101
 - writing efficient, 251–262
- External Tools tab (Desktop ribbon), 24

F

- Fabric, 3
- fact tables, 84
- field parameters, reports, 186–190

- fields, hiding unnecessary, 249
- File category (Get Data dialog), 36
- filters, applying, 145–148
- Filters pane, 24–25, 126–128
- folders, data extraction, 44–46
- forecasting, 166–167
- Format pane, Report view, 145–148
- Format setting (Column tools tab), 91–96
- formulas
 - descriptions, 282
 - variables, 251–252
- functions, costly and complex, 252–253

G

- Gartner Quadrant, 4
- geographic data, visualizing using maps, 154–157
- Get Data feature, 36–51
- granularity, reducing, 241–244
- grouping data, Power Query, 70–71

H

- hierarchical visualization, Report view, 132
- high cardinality, 243–244
- Home tab (Desktop ribbon), 23
- hybrid models, 250

I

- images, reports, 183–185
- Import storage mode, 52–53
- inactive relationships, 90–91
- Insert tab (Desktop ribbon), 23
- insights
 - dashboard tiles, 226–228
 - showing with tooltips and field parameters, 186–190
- installation, Desktop, 14–19
- interactions, optimizing, 254–255
- interface, Power Query Editor, 35–36
- intermediary queries, Power Query, 242

K

- KEEPFILTERS function, 116
- key indicators, Report view, 131

L

- layouts
 - organizing, 145–148
 - semantic model, 96–97
- Left Navigation pane (Service), 202
- licenses, Power BI, 197–199
- line charts, 165–168
 - Report view, 137–142
- lines, Report view, 129
- layouts, reports, 192–194

M

- many-to-many relationships, 250–251
- maps, visualizing geographic data, 154–157
- matrices, optimization, 256–259
- measures
 - breaking down, 160–163
 - DAX, 103
 - zero values, 252
- metrics
 - emphasizing key, 261
 - Report view, 131
- Microsoft Fabric. *see* Fabric
- Microsoft Fabric category (Get Data dialog), 36
- Microsoft Store, Desktop installation, 14–15
- Mobile, 1, 8–9
- Model view (Desktop), 26
- Modeling tab (Desktop ribbon), 23
- models. *see* semantic models
- multi-column aggregations, DAX, 109–110

N

- Name setting (Column tools tab), 91–96
- names, descriptive, 248–249
- narrative text, 167–168
- narrative visuals
 - Copilot, 285
 - creating, Copilot, 278–280

O

- online services, data extraction, 51
- Online Services category (Get Data dialog), 36
- Optimize tab (Desktop ribbon), 24
- ORDERBY function, 118
- Organizational privacy level, 53
- Other category (Get Data dialog), 36

P

- Pages tab (Desktop), 25
- panels (Desktop), 24–25
- patterns, scatter charts, revealing, 157–160
- Performance Analyzer, 257–259
- permissions, reports, 212
- personal email accounts, support, 21
- Power BI, 1–3, 198–201. *see also* Desktop
 - capacities, 199
 - complex transformations, 244
 - Desktop, 1, 5–6, 13
 - installation, 14–19
 - licenses, 197–199
 - Mobile, 1, 8–9
 - personal email accounts, 21
 - publishing reports, 201–212
 - roles, 9–10
 - Service, 1, 6–8
 - Service account, configuring, 200–201
 - star schema, 248
 - subscriptions, 197–199
 - workspaces, 199
- Power Platform category (Get Data dialog), 36
- Power Query, 59–60
 - changing table structures, 71–78
 - columnar transformations, 61–62
 - combining columns, 65–66
 - complex transformations, 244
 - data cleansing, 60
 - data quality, 60
 - data summary, 249–250
 - data types, 61, 245
 - example columns, 69–70
 - filling missing content, 62–63
 - grouping data, 70–71
 - intermediary queries, 242
 - queries, renaming, 244
 - query folding, 246–247
 - removing duplicates, 63–64
 - replacing values, 67–69
 - staging, 242
 - steps
 - consolidation, 245
 - renaming, 244
 - text extraction, 66–67
- Power Query Editor, 34
- PPU (Premium Per User), Power BI, 198
- Premium Per User (PPU), Power BI, 198
- Preview features option, 28

- PREVIOUS function, 117
- privacy levels, 53–54
- Private privacy level, 53
- proportion charts, Report view, 130
- Public privacy level, 53
- publishing
 - apps, 209–211
 - reports, 201–212

Q

- Qlik, 4
- queries
 - Copilot, 285–287
 - DAX, Copilot, 280–281
 - renaming, 244
- query folding, 48
 - leveraging, 246–247

R

- relational data sources, data extraction, 46–48
- relationship charts, Report view, 130
- relationships
 - active, 90–91
 - bidirectional, 251
 - cardinality, 84
 - defining tables, 84–86
 - differentiating table types, 86–89
 - inactive, 90–91
 - many-to-many, 250–251
 - optimization, 250–251
 - semantic models, 84–91
- REMOVEFILTERS function, 114
- renaming queries and steps, 244
- report authors, Copilot, 268
- report creators, 9
- Report view, 26, 123–126
 - area charts, 129
 - cards, 133–137
 - Column charts, 128–129
 - contribution charts, 130
 - filters, applying, 145–148
 - Filters pane, 126–128
 - hierarchical visualization, 132
 - key indicators, 131
 - layouts, organizing, 145–148
 - line charts, 137–142
 - lines, 129

- metrics, 131
- proportion charts, 130
- relationship charts, 130
- ribbon charts, 143
- slicers, 132–133
 - applying, 145–148
- stacked bar charts, 142–143
- stacked column charts, 145
- treemaps, 144
- trend analysis, 130
- tubular visualization, 132
- visual objects, 128, 133
- reports
 - applying themes, 176–180
 - bookmarks, 190–192
 - building dashboards from, 215–216
 - creating, Copilot, 276–278
 - data volume, reducing, 241–244
 - drillthrough pages, 180–182
 - field parameters, 186–190
 - granularity, reducing, 241–244
 - insights, 186–190
 - layouts, 192–194
 - permissions, 212
 - publishing, 201–212
 - RLS (row-level security), 233–234
 - sharing, 205–212
 - summaries, creating, 284–285
 - tooltips, 186–190
 - trigger actions, 183–185
- ribbon (Desktop), 22–24
- ribbon charts, Report view, 143
- RLS (row-level security), 233–234
- roles
 - assigning, 238–239
 - Copilot, 268–269
 - Desktop, defining, 234–238
 - testing
 - Desktop, 238
 - Service, 239–241
- row-level security (RLS), 233–234

S

- scatter charts, revealing patterns, 157–160
- scheduling, data refreshes, 203–205
- semantic models, 81–82
 - AI (artificial intelligence), 272–276
 - customizing, 91–96
 - dimension tables, 84

- fact tables, 84
- layouts, 96–97
- multiple tables, 83–84
- optimization, 247
- relationships, 84–91
 - optimization, 250–251
- single table, 82–83
- Service, 1, 6–8
 - account, configuring, 200–201
 - Copilot, 282–286
 - navigating, 202–203
 - roles, testing, 239–241
 - sharing reports, 205–212
- shapes, reports, 183–185
- sharing, reports, 205–212
- slicers, 189
 - optimization, 255
 - Report view, applying, 145–148
- slow visuals, troubleshooting, 257–259
- small multiples, 163–165
- Sort by column setting (Column tools tab), 91–96
- stacked bar charts, Report view, 142–143
- stacked column charts, Report view, 144
- staging, Power Query, 242
- star schema, design, 248
- steps
 - consolidation, 245
 - renaming, 244
- storage modes, 51–53
- subscriptions, Power BI, 197–199
- summaries, reports, creating, 284–285
- Summarization setting (Column tools tab), 91–96

T

- Tableau, 4
- tables
 - appending, 76–78
 - changing structures, 71–78
 - combining, 74–76
 - dimension, 84
 - fact, 84
 - optimization, 256–259
 - relationships
 - defining, 84–86
 - differentiating types, 86–89
- testing
 - roles
 - Desktop, 238
 - Service, 239–241

- text extraction, Power Query, 66–67
- themes, reports, applying, 176–180
- tiles
 - dashboards, 216–219
 - customizing, 219–221
 - data alerts, 224–226
 - insights, 226–228
- tooltips, reports, 186–190
- Top Bar, Service, 203
- transformations, Power BI, 244
- treemaps, Report view, 144
- trend analysis, Report view, 130
- trend lines, 165–166
- trigger actions, reports, 183–185
- tubular visualization, Report view, 132

U

- unpivoting columns, 71–72
- UNRELATIONSHIP function, 116

V

- variables
 - comparing, 157–160
 - DAX formulas, 251–252
- View Native Query, 247
- View tab (Desktop ribbon), 24
- views, Desktop, 26
- visual calculations, DAX, 104–105
 - integration, 117–119

- visual objects, Report view, 133
- visualizations
 - animated, 257
 - breaking down measures, 160–163
 - certified, 257
 - comments, 223
 - data, 253–254
 - decomposition trees, 160–163
 - displaying multiple comparisons, 163–165
 - geographic data, 154–157
 - hierarchical, 132
 - line charts, 165–168
 - narrative, creating, 278–280
 - narrative text, 167–168
 - scatter charts, revealing patterns, 157–160
 - troubleshooting slow, 257–259
 - tubular, 132
 - variable comparisons, 157–160

W

- webpages, data extraction, 48–50
- workspaces
 - collaboration, 208–209
 - Power BI, 199
- writing, expressions, 251–262

Z

- zero values, measures with no data, 252–253